Folic Acid Campaign and Evaluation — Southwestern Virginia, 1997–1999

A needs assessment conducted in rural southwestern Virginia in 1996 indicated higher rates of birth defects in that region than in the entire state (*1*). In response to these findings, in January 1997 the regional perinatal council conducted a community folic acid information campaign designed to raise awareness about the 1992 Public Health Service recommendation that all women who are capable of becoming pregnant consume 400 μg (0.4 mg) of the B vitamin folic acid every day to decrease their risk for having a pregnancy affected with spina bifida or other neural tube defects (NTDs) (*2*). This report describes the information campaign and the findings from precampaign and postcampaign surveys, which showed a significant increase in reported awareness and knowledge of the benefits of folic acid and reported knowledge about the sources of folic acid.

During 1997, a year-long community information campaign targeted an estimated 22,500 women of childbearing age in a four-county area of southwestern Virginia. The campaign included television and radio public service announcements (PSAs), a news conference, newspaper advertisements, and billboards. The television and radio PSAs used actors from the local theater and local broadcasting students. Printed materials included brochures, posters, information cards, food labels, flyers, banners, and display boards. Focus groups and readability tests were conducted to help develop print materials. A local grocery store chain helped promote the use of folate-dense foods, folic acid vitamin supplements, fortified cereals, and multivitamin supplements by having volunteers specially label specific foods and hand out educational materials. Volunteers also distributed green ribbons in the communities to promote folic acid awareness. Local school board members and teachers developed a folic acid teaching packet for use in health education and biology classes for students in grades 5–12 and college-level nursing programs.

The campaign activities and results were evaluated using precampaign and postcampaign random sample telephone surveys to assess folic acid awareness and knowledge. The precampaign survey, conducted during January 1997, included 412 women aged 18–45 years chosen by a systematic random sample of listed telephone numbers. The postcampaign telephone surveys were conducted during January 1998 (n=419) and February 1999 (n=278), using identical survey methods and an additional question about the source of folic acid information.

Based on responses to the question "Have you heard about the benefits of folic acid?", reported awareness increased significantly, from 31% in 1997 (precampaign) to 54% in 1998 (postcampaign), and to 75% in 1999 (sustainability survey) ($p<0.05$, chi-square test) (Table 1). Among women who reported hearing about the benefits of folic acid, the proportion who correctly answered that one benefit of folic acid was to help prevent certain birth defects increased from 77% in 1997 to 81% in 1998 and to 88% in 1999. Among women who reported in the postcampaign survey that they had heard about folic acid, knowledge about ways to increase consumption increased from 55% in 1997 to 73% in 1999, but correct knowledge about the best time to take folic acid (before or during pregnancy) did not increase. Women who had heard of folic acid cited television and health-care providers as the two leading sources of information.

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Editorial Note: National surveys indicate that awareness of folic acid among reproductive-aged women increased from 52% in 1995 to 68% in 1998, although increases in use of folic acid-containing vitamins were modest, from 28% to 32% (*3*). Increasing the number of women who consume 400 μg of folic acid per day depends on the success of national and local health communication campaigns. The campaign described in this report demonstrated that with limited resources, community volunteers and campaign staff were able to use qualitative formative research methods to develop health communication materials, enlist the assistance of private- and public-sector community partners, and survey women about folic acid knowledge and awareness in this community.

The findings of the surveys in southwestern Virginia are subject to at least four limitations. First, the changes in awareness and knowledge might have resulted from other national media efforts rather than the local campaign. Second, because the survey did not collect information about characteristics such as age, parity, or pregnancy intention, different awareness and knowledge levels among these subsets of reproductive-aged women cannot be assessed. For example, awareness and knowledge could have increased more among women who were planning a pregnancy than among women not planning a pregnancy. Third, the women in the counties surveyed may not be representative of reproductive-aged women in this age group in this region of Virginia or in the United States. Finally, an increase in knowledge is an intermediate outcome and may not be related directly to an increase in intake of folic acid or a decrease in the occurrence of NTDs. For example, women knowledgeable about the benefits of folic acid may have other barriers to changing their behavior to increase consumption. To overcome these barriers, women need both knowledge and resources to make and sustain behavior change, particularly for an active modification such as daily vitamin consumption (*4*).

Another method to facilitate increased folic acid intake without relying solely on active behavior change is through food fortification. Since January 1998, "enriched" cereal grain products must be fortified with folic acid at a level of 140 μg per 100 g of cereal grain product (*5*). Fortification will increase folic acid consumption among reproductive-aged women, but many women will still consume <400 μg of synthetic folic acid daily (*6*). In 1998, the Institute of Medicine recommended that women capable of becoming pregnant take 400 μg of synthetic folic acid daily from fortified foods and/or supplements in addition to consuming food folate from a varied diet (*7*). Women are advised to consume foods fortified with folic acid (e.g., breakfast cereals, enriched breads, and pastas) in addition to a balanced diet including folate-dense foods, such as leafy green vegetables, orange juice, and beans. Use of supplements containing folic acid, even though it requires a behavior change, remains a convenient way to assure consumption of 400 μg daily.

Despite the limitations of survey methods used in the study in southwestern Virginia, the relatively low cost and ease of implementation made such a survey feasible in this community evaluation. Other more objective evaluation methodologies for folic acid interventions include measurements of blood folate levels and monitoring the rates of NTD-affected pregnancies. Preintervention and postintervention blood folate

TABLE 1. Assessment of knowledge related to folic acid among childbearing-aged women before and after an education campaign and to assess sustainability of knowledge — southwestern Virginia, 1997, 1998, and 1999

	1997 (precampaign)				1998 (postcampaign)				1999 (sustainability)			
		Responses				Responses				Responses		
Question	No. respondents	No.	(%)	(95% CI*)	No. respondents	No.	(%)	(95% CI)	No. respondents	No.	(%)	(95% CI)
1. Have you heard about the benefits of folic acid?												
Answer: Yes	412	128	(31)	(27%–36%)	419	226	(54)	(49%–59%)	278	207	(75)	(69%–80%)†
2. What is one benefit of folic acid?§												
Answer: It helps prevent certain birth defects	128	98	(77)	(68%–84%)	226	184	(81)	(76%–86%)	207	183	(88)	(83%–92%)†
3. When is the best time to take more folic acid?¶												
Answer: Before you become pregnant	98	85	(87)	(78%–93%)	184	150	(82)	(75%–87%)	183	162	(89)	(83%–93%)
4. What are ways to take in more folic acid?¶,**												
Answer: Eat more foods such as broccoli, legumes, cereal and orange juice	98	83	(85)	(76%–91%)	184	157	(85)	(79%–91%)	183	167	(91)	(86%–95%)†
Answer: Take a daily multivitamin with folic acid	98	63	(64)	(54%–74%)	184	135	(73)	(66%–80%)	183	145	(79)	(73%–85%)†
Answer: Use both folate-rich foods and multivitamins	98	54	(55)	(45%–65%)	184	115	(63)	(55%–70%)	183	134	(73)	(66%–80%)†
5. Where did you hear about folic acid?,††**												
Television	—				184	108	(59)	(51%–66%)	206	89	(43)	(36%–50%)§§
Health-care provider	—				184	52	(28)	(22%–35%)	206	56	(27)	(21%–34%)
Other¶¶	—				184	36	(20)	(14%–26%)	206	20	(10)	(6%–15%)§§
Posters or brochures	—				184	29	(16)	(11%–22%)	206	10	(5)	(2%– 9%)§§
Health department	—				184	21	(11)	(7%–17%)	206	9	(4)	(2%– 8%)§§
School	—				184	15	(8)	(5%–13%)	206	7	(3)	(1%– 7%)§§
Friend or relative	—				184	13	(7)	(4%–12%)	206	10	(5)	(2%– 9%)
Radio	—				184	6	(3)	(1%– 7%)	206	2	(1)	(0%– 4%)
Billboard	—				184	5	(3)	(1%– 6%)	206	3	(2)	(1%– 4%)

*Confidence interval.
†Significant change from 1997 to 1999 ($p<0.05$).
§Asked only of those who answered yes to question 1.
¶Asked only of those who chose the correct answer to question 2.
**The sum of the percentages does not equal 100% because of multiple responses in the survey.
††Not asked in 1997 survey.
§§Significant change from 1998 to 1999 ($p<0.05$).
¶¶Specified as, but not limited to, newspapers and magazines.

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levels can be used to assess the effectiveness of interventions at the community level but require substantial resources to obtain and measure the blood samples. On the national level, blood folate measurements collected in the National Health and Nutrition Examination Survey can be used to evaluate the impact of interventions. Accurate NTD monitoring requires the inclusion of affected pregnancies that were prenatally detected to assess the impact of consuming folic acid independent from that of the increasing use of prenatal diagnosis. The large population size necessary to detect a change in NTD rates limits the use of NTD rate monitoring to evaluate local campaigns, although NTD data from several states or communities can be combined to assess the impact of interventions in larger populations.

NTDs occur very early in pregnancy. Because more than 50% of pregnancies in the United States are mistimed or unplanned (*8*), it is especially important to increase women's knowledge about the importance of consuming folic acid before pregnancy. In 1999, CDC, the National March of Dimes Birth Defects Foundation, and the National Council on Folic Acid began a national education campaign with materials targeted to women who are thinking about pregnancy ("Before You Know It") and to women who are able to get pregnant even though they are not planning on it in the near future ("Ready, Not"). The campaign includes a series of PSAs and other outreach activities to women of reproductive age and to health-care providers.

More experience is needed in implementing and evaluating folic acid campaigns to determine which interventions are most effective. States and communities are encouraged to share their experiences and lessons learned with other states and communities that are planning interventions. The folic acid education campaign in Virginia is one of several examples included in a resource guide for folic acid campaigns (*9*). The resource guide and other educational materials on folic acid are available by contacting CDC by e-mail, flo@cdc.gov, or by telephone, (888) 232-6789.

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